

## Dimensional Analysis Worksheet #2

1. 261 g  $\rightarrow$  kg
2. 3 days  $\rightarrow$  seconds
3. 9,474 mm  $\rightarrow$  cm
4. 0.73 kL  $\rightarrow$  L
5. 5.93 cm<sup>3</sup>  $\rightarrow$  m<sup>3</sup>
6. 498.82 cg  $\rightarrow$  mg
7. 1 ft<sup>3</sup>  $\rightarrow$  m<sup>3</sup>  
(Note: 3.28 ft = 1 m)
8. 1 year  $\rightarrow$  minutes
9. 175 lbs  $\rightarrow$  kg  
(Note: 2.2 lb = 1 kg)
10. 4.65 km  $\rightarrow$  m
11. 22.4 kg/L to kg/mL
12. 0.74 Kcal/min to cal/sec
13. 1.42 g/cm<sup>2</sup> to mg/mm<sup>2</sup>
14. 10095 m/s to miles/s
15. 9.81 m/s<sup>2</sup> to ft/s<sup>2</sup>
16. 8.41 g/mL to Kg/L
17. 3.8 Km/sec to miles/year
18. 7.68 cal/sec to Kcal/min
19. 8.24 g/cm<sup>2</sup> to mg/mm<sup>2</sup>
20. 25 m/s to miles/hr
21. Convert  $2.05 \times 10^5$  seconds into years.
22. Traveling at 65 miles/hour, how many minutes will it take to drive 125 miles to San Diego?
23. Convert 50 years into seconds. Express your answer in scientific notation.
24. Traveling at 65 miles/hour, how many feet can you travel in 22 minutes? (1 mile = 5280 feet)

25. One sphere has a radius of 5.10 cm; another has a radius of 5.00 cm. What is the difference in volume (in cubic centimeters) between the two spheres? Give the answer to the correct number of significant figures. The volume of a sphere is  $(4/3)\pi r^3$ , where  $\pi = 3.1416$  and  $r$  is the radius.
26. The total amount of fresh water on earth is estimated to be  $3.73 \times 10^8 \text{ km}^3$ . What is this volume in cubic meters? In liters?
27. Sally Leadfoot was pulled over on her way from Syracuse to Ithaca by an officer claiming she was speeding. The speed limit is 65 mi/hr and Sally had traveled 97 km in 102 minutes. How fast was Sally's average speed? Does she deserve a ticket?
28. Marie was trying to make her favourite recipe but was not sure of the conversions. Would you eat these cookies?

Recipe	Marie's Conversions
2 $\frac{1}{4}$ Cups flour	0.5 litre flour
0.5 lbs choc. chips	2000 g choc. chips
325 degrees Fahrenheit	373 Kelvin

29. Winnipeg is refilling the pool. How many gallons of water will it take if the pool is 50m by 25m by 1.5m? (1 gallon = 3.786 L)
30. Meredith found some lace at a price of 4.0 £/meter in Ireland that she liked but was afraid she was paying too much for it. The same lace in the Canada would sell for \$5.99/yd. Was she paying too much for it? (\$1 = 0.498 £) (1 yard = 3 ft)
31. At a given point in its orbit, the moon is  $2.4 \times 10^5$  miles from earth. How long does it take light from a source on earth to reach a reflector on the moon and then return to earth? (speed of light is  $3.0 \times 10^8 \text{ m/s}$ )
32. In Raiders of the Lost Ark, Indiana Jones tried to remove a gold idol from a booby-trapped pedestal. He replaces the idol with a bag of sand. If the idol has a mass of 2.00 kg, how many litres of sand must he place on the pedestal to keep the mass sensitive booby-trap from activating? (Density of sand is  $3.00 \text{ g/cm}^3$ )

1. 261 g  $\rightarrow$  kg  
0.261 kg
2. 3 days  $\rightarrow$  seconds  
 $3 \times 10^5$  s
3. 9,474 mm  $\rightarrow$  cm  
947.4 cm
4. 0.73 kL  $\rightarrow$  L  
730 L
5.  $5.93 \text{ cm}^3 \rightarrow \text{m}^3$   
 $5.93 \times 10^{-6} \text{ m}^3$
6. 498.82 cg  $\rightarrow$  mg  
4988.2 mg
7.  $1 \text{ ft}^3 \rightarrow \text{m}^3$   
(Note:  $3.28 \text{ ft} = 1 \text{ m}$ )  
 $0.028 \text{ m}^3$
8. 1 year  $\rightarrow$  minutes  
525600
9. 175 lbs  $\rightarrow$  kg  
(Note:  $2.2 \text{ lb} = 1 \text{ kg}$ )  
79.5 kg
10. 4.65 km  $\rightarrow$  m  
4650 m
11. 22.4 kg/L to kg/mL  
0.0224 kg/mL
12. 0.74 Kcal/min to cal/sec  
12 cal/sec
13.  $1.42 \text{ g/cm}^2 \rightarrow \text{mg/mm}^2$   
14.2 mg/mm<sup>2</sup>
14. 10095 m/s to miles/s  
6.3094 miles/s
15.  $9.81 \text{ m/s}^2 \rightarrow \text{ft/s}^2$   
32.2 ft/s<sup>2</sup>
16. 8.41 g/mL to Kg/L  
8.41 Kg/L
17. 3.8 Km/sec to miles/year  
 $7.5 \times 10^7$  miles/year
18. 7.68 cal/sec to Kcal/min  
0.461 Kcal/min
19.  $8.24 \text{ g/cm}^2 \rightarrow \text{mg/mm}^2$   
82.4 mg/mm<sup>2</sup>
20. 25 m/s to miles/hr  
=56 miles/hr

21. Convert  $2.05 \times 10^5$  seconds into years.  
 $6.50 \times 10^{-3}$  years

22. Traveling at 65 miles/hour, how many minutes will it take to drive 125 miles to San Diego?  
115 min

23. Convert 50 years into seconds. Express your answer in scientific notation.  
 $1.58 \times 10^9$  s

24. Traveling at 65 miles/hour, how many feet can you travel in 22 minutes? (1 mile = 5280 feet)  
a. 125 840 ft

25. One sphere has a radius of 5.10 cm; another has a radius of 5.00 cm. What is the difference in volume (in cubic centimeters) between the two spheres? Give the answer to the correct number of significant figures. The volume of a sphere is  $(4/3)\pi r^3$ , where  $\pi = 3.1416$  and r is the radius.  
  
32.0 cm<sup>3</sup>

26. The total amount of fresh water on earth is estimated to be  $3.73 \times 10^8 \text{ km}^3$ . What is this volume in cubic meters? In liters?  
 $3.73 \times 10^{17} \text{ m}^3$   
 $3.73 \times 10^{20} \text{ L}$

27. Sally Leadfoot was pulled over on her way from Syracuse to Ithaca by an officer claiming she was speeding. The speed limit is 65 mi/hr and Sally had traveled 97 km in 102 minutes. How fast was Sally's average speed? Does she deserve a ticket?

35.7 mi/h, no

28. Marie was trying to make her favourite recipe but was not sure of the conversions. Would you eat these cookies?

Recipe

Marie's Conversions

2  $\frac{1}{4}$  Cups flour

0.5 litre flour

0.5 lbs choc. chips

2000 g choc. chips

325 degrees Fahrenheit

373 Kelvin

29. Winnipeg is refilling the pool. How many gallons of water will it take if the pool is 50m by 25m by 1.5m? (1 gallon = 3.786 L)  
 $5 \times 10^5$  gallons

30. Meredith found some lace at a price of 4.0 £/meter in Ireland that she liked but was afraid she was paying too much for it. The same lace in the Canada would sell for \$5.99/yd. Was she paying too much for it? (\$1 = 0.498 £)

\$7.35/yard, yes

31. At a given point in its orbit, the moon is  $2.4 \times 10^5$  miles from earth. How long does it take light from a source on earth to reach a reflector on the moon and then return to earth? (speed of light is  $3.0 \times 10^8$  m/s)  
 $1.3 \text{ s} \times 2 = 2.6 \text{ s}$

32. In Raiders of the Lost Ark, Indiana Jones tried to remove a gold idol from a booby-trapped pedestal. He replaces the idol with a bag of sand. If the idol has a mass of 2.00 kg, how many litres of sand must he place on the pedestal to keep the mass sensitive booby-trap from activating? (Density of sand is  $3.00 \text{ g/cm}^3$ )

0.667 L